

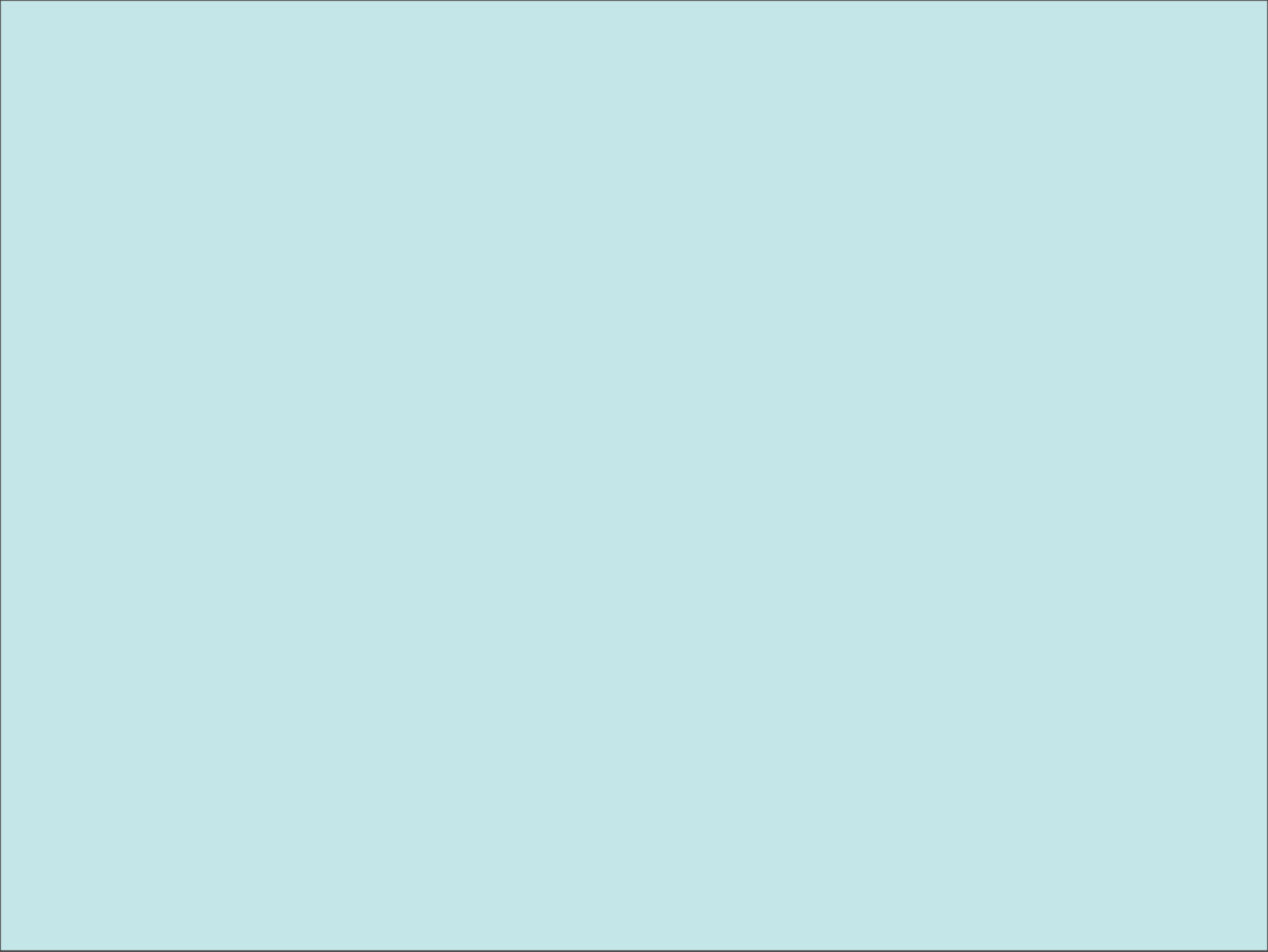
An architectural floor plan of a house is shown on a white sheet of paper. The plan includes a 'TWO CAR GARAGE' (20' x 21'), a 'LAUN' (Laundering) room, a 'BED RM 2' (10' x 12'), a 'FOYER', and a 'SALON'. Dimensions like '56'-8"', '16'-0"', and '20'-0"' are visible. The drawing is surrounded by drafting tools: a large metal compass in the top left, a yellow folding ruler at the bottom left, and several pens and pencils scattered around. A large, light blue arrow points from the bottom right towards the center of the plan.

# Raster vs. Vector

The background of the slide is a detailed architectural floor plan of a house. The plan includes a 'TWO CAR GARAGE' (20' x 21'), a 'LAUN' (Laundering) room, a 'BED RM 2' (10' x 12'), and a 'FOYER'. There are also labels for 'CLO' (Closets), 'LIN' (Linen closet), 'BALCON ABOVE', and 'SLIDING DOOR'. Dimensions like '56'-8"', '16'-0"', and '20'-0"' are visible. In the top left corner, there is a 3D rendering of a desk lamp. At the bottom, there are various drafting tools: a large set square, a compass, a yellow folding ruler, and several markers (black, blue, green, red).

# Raster vs. Vector

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  - Raster Images
  - Vector Images

- All electronic art images are divided into one of two types:
  - Raster Images
  - Vector Images
- These two formats are very different from each other, yet they contrast and complement one another when used appropriately for the final output method.

# What is Raster Art?

- A **raster image** is a collection of dots called pixels. Each pixel is a tiny colored square. When an image is scanned, the image is converted to a collection of pixels called a raster image. Scanned graphics and web graphics (JPEG and GIF) files are the most common forms of raster images.

# Resolution of Raster Images

- The resolution of a raster or scanned image is expressed in terms of dots per inch = dpi. Typical laser printers print at 300-600 dpi. There are printers that are capable of producing smoother and cleaner output because they have higher dpi ratings. The output quality of a printing device is dependent upon the resolution of a bitmap or scan. If you take a 300 dpi bitmap and size it up in Photoshop you will see that the image becomes pixilated. The edges now look jagged and all that has happened is the tiny pixel squares got bigger. If you decrease the size of the image the pixel squares will return to there original state. With this said, raster images do not scale up very well.
- The quality of a print produced from a raster image is dependent upon three things:
  - 1. One the resolution of the raster image or dpi.
  - 2. The capabilities of the printing technology.
  - 3. Whether or not the image has been scaled up.

# Color in Raster Images

- When scanning a raster image a large number of colors will be required to render a raster image reproduction of the original source artwork accurately. To get around this difficulty scanners use a process called **dithering** to approximate colors that don't occur in the current color palette. Dithering produces a distinct dotted pattern that approximates the original color in an image. It will then deteriorate the quality of the scanned raster image. This is where editing and manipulating raster images becomes the most complicated. In order to change a color in the raster image you must isolate a specific color or a specific range of colors and tell the software to change the color.



# File Sizes for Raster Images

- When creating and scanning raster images, file size can become a real issue. In order to accurately reproduce a raster image file the graphics software must keep track of a large amount of information, including the exact location and color of each pixel and the collection of pixels.

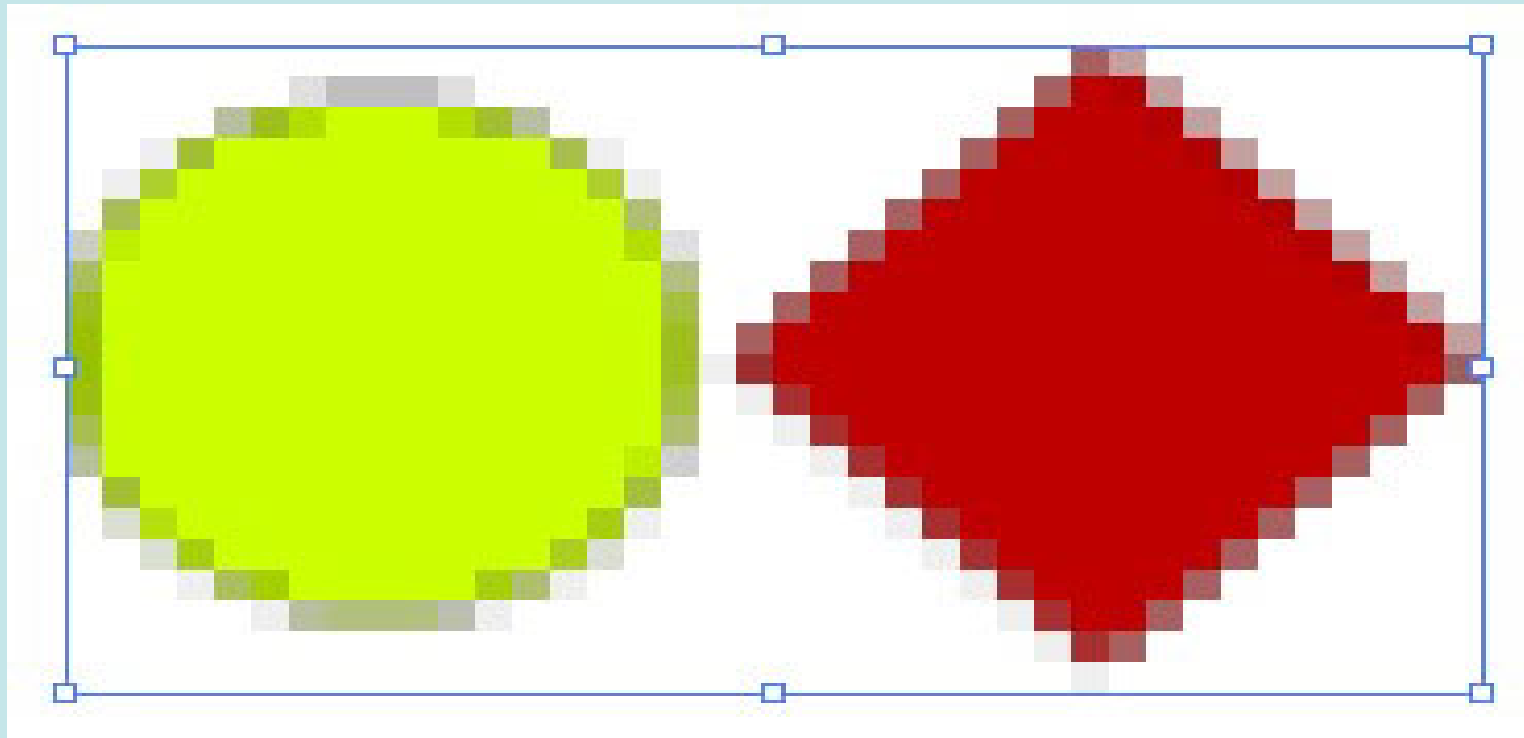
# File Formats for Raster Images

Common **raster image formats** include the following:

- BMP (Windows Bitmap)
- PCX (Paintbrush)
- TIFF (Tag Interleave Format)
- JPEG (Joint Photographics Expert Group)
- GIF (Graphics Interchange Format)
- PNG (Portable Network Graphic)
- PSD (Adobe Photoshop)
- CPT (Corel PhotoPAINT)

# Examples of Raster Art





# What is Vector Art?

- A **vector image** is a collection of connected lines and curves that produce objects. When creating a vector image in a vector illustration program, node or drawing points are inserted which lines and curves connect those together. This is the same principle as connect the dots. Each node, line and curve is defined in the drawing by the graphics software by a mathematical description. Every aspect of a vector object is defined by math included node position, node location, line length and on down the line. Text objects are created by connecting nodes, lines and curves. Every letter in a font starts out as a vector object.
- Vector images are object-oriented while raster images are pixel oriented. A vector object will have a wire frame underneath the colors in the object. In a vector object, colors are like clothes over the top of a skeleton. CorelDRAW and Illustrator create text and objects using vectors that can be easily manipulated.

# Resolution of Vector Images

- **Vector images** are defined by math, not pixels. They can be scaled up or down without any loss of quality. When an illustration (drawing) program sizes a vector image up or down, it simply multiplies the mathematical description of the object by a scaling factor.
  - For example, a 1" square object would need to be multiplied by a factor of 2 in order to double in size.
- The math is simply recalculated to produce an object twice the size of the original. Because vector images scale up or down without the loss of image quality, they can be output at any resolution that a printer is capable of producing. Unlike raster images, quality is not limited by dots per inch or scanning resolution. This is a big reason that vector graphics are so popular for clip art.

# Color in Vector Images

- Since **vector images** are composed of objects not pixels, you can change the color of individual objects without worrying about individual pixels.
- Coloring vector objects is similar to coloring with crayons in a coloring book. A drawing program will enable a user to click inside an object and define its color. A drawing program will also enable a user to define the color and width of lines. Coloring vector images is much easier than coloring bitmaps.

# File Sizes for Vector Images

- Vector images do not need to keep track of each individual pixel in an image, only mathematical descriptions. For this reason vector files are very small in file size.
- Vector files are composed of long mathematical descriptions dictating every aspect of the graphic. A 2-inch by 4-inch vector based logo will be the same file size as a 2-foot by 4-foot logo. The file size is the same because the only difference in file is one number defining the size of the file.
- A raster image file would need to keep track of a whole bunch of additional pixels as the file increases in size. Most vector-based logos are going to be under 100k (.10 megabytes). For this reason, vector files are ideally suited for transfer over the Internet.



# File Formats for Vector Images

Common **vector formats** include the following:

- EPS (Encapsulated PostScript)
- WMF (Windows Metafile)
- AI (Adobe Illustrator)
- CDR (CorelDraw)
- DXF (AutoCAD)
- SVG (Scalable Vector Graphics)

# Examples of Vector Art



